

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

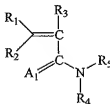
What is claimed is:

1.-23. Canceled.

24. (Currently Amended) A method for separating a mixture of biomolecules, comprising:

(1) contacting a composition comprising a buffer and an effective amount of a poly(M₁-g-M₂), or a salt thereof, wherein:

(a) poly(M₁-g-M₂) is comprised of a first backbone polymer, poly (M₁), formed from a monomer unit each M₁ [[has]] having the formula (I):



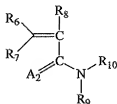
wherein each A₁ is independently O, S or NX₁;

each of R₁, R₂, R₃ and R₄ is independently H, C₁-C₂₀ alkyl, C₄-C₁₂ cycloalkyl, C₅-C₁₂ aryl, C₄-C₁₂ heteroaryl, -(C₁-C₂₀ alkyl)(C₅-C₁₂ aryl) or -(C₅-C₁₂ aryl)(C₁-C₂₀ alkyl);

each R₅ is independently C₁-C₂₀ alkyl, C₁-C₂₀ heteroalkyl, C₄-C₁₂ cycloalkyl, C₄-C₁₂ heterocycloalkyl, C₅-C₁₂ aryl, C₄-C₁₂ heteroaryl, -(C₁-C₂₀ alkyl)(C₄-C₁₂ cycloalkyl), -(C₄-C₁₂ cycloalkyl)(C₁-C₂₀ alkyl), -(C₁-C₂₀ heteroalkyl)(C₄-C₁₂ cycloalkyl), -(C₄-C₁₂ cycloalkyl)(C₁-C₂₀ heteroalkyl), -(C₁-C₂₀ alkyl)(C₄-C₁₂ heterocycloalkyl), -(C₄-C₁₂ heterocycloalkyl)(C₁-C₂₀ alkyl), -(C₁-C₂₀ heteroalkyl)(C₄-C₁₂ heterocycloalkyl), -(C₄-C₁₂ heterocycloalkyl)(C₁-C₂₀ heteroalkyl), -(C₁-C₂₀ alkyl)(C₅-C₁₂ aryl), -(C₅-C₁₂ aryl)(C₁-C₂₀ alkyl), -(C₁-C₂₀ heteroalkyl)(C₅-C₁₂ aryl), -(C₅-C₁₂ aryl)(C₁-C₂₀ heteroalkyl), -(C₁-C₂₀ alkyl)(C₄-C₁₂ heteroaryl), -(C₄-C₁₂ heteroaryl)(C₁-C₂₀ alkyl), -(C₁-C₂₀ heteroalkyl)(C₄-C₁₂ heteroaryl), -(C₄-C₁₂ heteroaryl)(C₁-C₂₀ heteroalkyl), -(C₁-C₄ alkyl)_qNH₂, -(C₁-C₄ alkyl)_qCONH₂, -(C₁-C₄ alkyl)NHCONH₂, -(C₁-C₄ alkyl)NHCOH or -(C₁-C₄ alkyl)_qNHCOCH₃, where each q is 0 or 1; and

each X₁ is independently H, C₁-C₂₀ alkyl, C₄-C₁₂ cycloalkyl, C₅-C₁₂ aryl, C₄-C₁₂ heteroaryl, -(C₁-C₂₀ alkyl)(C₅-C₁₂ aryl), -(C₅-C₁₂ aryl)(C₁-C₂₀ alkyl), -(C₁-C₄ alkyl)_qNH₂, -(C₁-C₄ alkyl)_qCONH₂, -(C₁-C₄ alkyl)NHCONH₂, -(C₁-C₄ alkyl)_qNHCOH or -(C₁-C₄ alkyl)_qNHCOCH₃, where each q is 0 or 1;

(b) poly(M₁-g-M₂) is comprised of a second pendent polymer, poly (M₂), grafted to poly(M₁) through a carbon-carbon bond, wherein the pendent polymer is comprised of a monomer unit each-M₂ [[has]] having the formula (II):



wherein each A₂ is independently O, S or NX₂;

each of R₆, R₇, R₈ and R₉ is independently H, C₁-C₂₀ alkyl, C₄-C₁₂ cycloalkyl, C₅-C₁₂ aryl, C₄-C₁₂ heteroaryl, -(C₁-C₂₀ alkyl)(C₅-C₁₂ aryl) or -(C₅-C₁₂ aryl)(C₁-C₂₀ alkyl);

each R₁₀ is independently H, C₁-C₂₀ alkyl, C₁-C₂₀ heteroalkyl, C₄-C₁₂ cycloalkyl, C₄-C₁₂ heterocycloalkyl, C₅-C₁₂ aryl, C₄-C₁₂ heteroaryl, -(C₁-C₂₀ alkyl)(C₄-C₁₂ cycloalkyl), -(C₄-C₁₂ cycloalkyl)(C₁-C₂₀ alkyl), -(C₁-C₂₀ heteroalkyl)(C₄-C₁₂ cycloalkyl), -(C₄-C₁₂ cycloalkyl)(C₁-C₂₀ heteroalkyl), -(C₁-C₂₀ alkyl)(C₄-C₁₂ heterocycloalkyl), -(C₄-C₁₂ heterocycloalkyl)(C₁-C₂₀ alkyl), -(C₁-C₂₀ heteroalkyl)(C₄-C₁₂ heterocycloalkyl), -(C₄-C₁₂ heterocycloalkyl)(C₁-C₂₀ heteroalkyl), -(C₁-C₂₀ alkyl)(C₅-C₁₂ aryl), -(C₅-C₁₂ aryl)(C₁-C₂₀ alkyl), -(C₁-C₂₀ heteroalkyl)(C₅-C₁₂ aryl), -(C₅-C₁₂ aryl)(C₁-C₂₀ heteroalkyl), -(C₁-C₂₀ alkyl)(C₄-C₁₂ heteroaryl), -(C₄-C₁₂ heteroaryl)(C₁-C₂₀ alkyl), -(C₁-C₂₀ heteroalkyl)(C₄-C₁₂ heteroaryl), -(C₄-C₁₂ heteroaryl)(C₁-C₂₀ heteroalkyl), -(C₁-C₄ alkyl)_qNH₂, -(C₁-C₄ alkyl)_qCONH₂, -(C₁-C₄ alkyl)_qNHCONH₂, -(C₁-C₄ alkyl)_qNHCOH or -(C₁-C₄ alkyl)_qNHCOCH₃, where each q is 0 or 1; and

each X₂ is independently H, C₁-C₂₀ alkyl, C₄-C₁₂ cycloalkyl, C₅-C₁₂ aryl, C₄-C₁₂ heteroaryl, -(C₁-C₂₀ alkyl)(C₅-C₁₂ aryl), -(C₅-C₁₂ aryl)(C₁-C₂₀ alkyl), -(C₁-C₄ alkyl)_qNH₂, -(C₁-C₄ alkyl)_qCONH₂, -(C₁-C₄ alkyl)_qNHCONH₂, -(C₁-C₄ alkyl)_qNHCOH or -(C₁-C₄ alkyl)_qNHCOCH₃, where each q is 0 or 1;

(c) ~~provided that at least one M₁ is different from at least one M₂;~~

with a mixture comprising a biomolecule; and

(2) applying an electric field to the composition in an amount sufficient to facilitate the separation of a biomolecule from the mixture.

25. (Original) The method of claim 24, wherein the separation is performed within a capillary tube and two or more biomolecules are polynucleotides.

26. (Original) The method of claim 25, wherein the separation has a crossover of at least 400 base pairs.
27. Canceled.
28. (Previously presented) The method of claim 24, wherein the composition further comprises a sieve polymer.
29. (Previously presented) The method of claim 28, wherein the sieve polymer is poly(acrylamide).
30. Canceled.
31. (Previously presented) The method of claim 24, wherein the poly(M_1 -g- M_2) or a salt thereof has a weight-average molecular weight of from about 150,000 Daltons to about 20 MDaltons.
32. (Previously presented) The method of claim 31, wherein the composition further comprises a sieve polymer or a salt thereof having a weight-average molecular weight of from about 100,000 Daltons to about 5 MDaltons.
33. (Previously presented) The method of claim 32, wherein the sieve polymer is substantially linear poly(acrylamide).
34. (Previously presented) The method of claim 24, wherein the buffer is an aqueous buffer.
35. (Previously presented) The method of claim 34, wherein the composition has a pH of from about 5 to about 11.
36. (Previously presented) The method of claim 34, wherein the composition has a pH of from about 7 to about 10.
37. (Previously presented) The method of claim 35, wherein the composition further comprises formamide, urea, pyrrolidone, *N*-methyl pyrrolidone or a mixture thereof.
38. (Previously presented) The method of claim 35, wherein the composition further comprises urea.
39. (Previously presented) The method of claim 35, wherein the composition further comprises formamide.
40. (Previously presented) The method of claim 24, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.
41. (Previously presented) The method of claim 25, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.
42. (Previously presented) The method of claim 26, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.

43. (Previously presented) The method of claim 28, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.
44. (Previously presented) The method of claim 29, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.
45. (Previously presented) The method of claim 31, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.
46. (Previously presented) The method of claim 32, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.
47. (Previously presented) The method of claim 33, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.
48. (Previously presented) The method of claim 34, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.
49. (Previously presented) The method of claim 35, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.
50. (Previously presented) The method of claim 36, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.
51. (Previously presented) The method of claim 37, wherein M_1 is *N,N*-dimethylacrylamide and M_2 is acrylamide.
52. (Previously presented) The method of claim 24, wherein the sum of the weight of all M_2 units present in the poly(M_1 -g- M_2) or a salt thereof divided by the sum of the weight of all M_1 units present in the poly(M_1 -g- M_2) or a salt thereof is at least about 0.1.
53. (Previously presented) The method of claim 31, , wherein the sum of the weight of all M_2 units present in the poly(M_1 -g- M_2) or a salt thereof divided by the sum of the weight of all M_1 units present in the poly(M_1 -g- M_2) or a salt thereof is at least about 0.1.
54. (New) The method of claim 1, wherein the second pendent polymer, poly(M_2), is grafted to poly(M_1) through R_3 , R_5 , or R_4 , if R_4 is not H.